

It is difficult to conceive how all traces of the vast igneous action which occurred within the distance of 30 miles from the Scottish Silurian area should be absent from the rocks of the Southern Uplands. The unconformability of the Caradoc deposits on the Upper Llandeilo strata in the Southern Uplands may perhaps afford some clue to this difficulty. The Skiddaw slates were probably ancient land in the area now occupied by the Lake district during the period of the deposition of the Upper Llandeilo rocks of the south of Scotland. This ancient land seems to have been subject to violent sub-aërial volcanic action, being the earlier epoch of the Caradoc series. During the later portion of the same epoch this violent volcanic action ceased, the area covered with igneous products again subsided beneath the sea, and allowed of the accumulation of the materials of the Coniston limestone and the succeeding groups.

In the Southern Uplands of Scotland the well-marked break recognised by the officers of the Survey points to a lapse of time between the deposition of the highest of the Upper Llandeilo groups and the conglomerates at the base of the Caradoc rocks. It is probably during this lapse of time that volcanic action was so rife on the other side of what is now the Solway Firth. This lapse of time is still further indicated by the comparative small development of the Caradoc rocks of the South of Scotland, as contrasted with those of the typical Caradoc areas of Shropshire and Wales, and also by their fossil contents, which indicate that only a portion of the group is represented in this area, and that this portion appertains to the upper part of the series.

From what has been said it will be apparent that the labours of the officers of the Geological Survey of Scotland have put us in possession of most important information concerning the very difficult series of rocks making up the strata of the bulk of the Southern Uplands. There are other matters amply detailed in the "Explanatory Memoirs" such as the metamorphism which the Silurian rocks have in some places undergone, and the intrusive rocks which are associated with them. The Old Red Sandstones as laid down in Sheet 15 are fully described. The important carboniferous areas of New Cumnock and Guelt, of Lugar and Muirkirk, and of Glespin or Douglas Water, with their thin limestone and low coal, are largely detailed. In relation to Dumfriesshire, the Sanquhar coal-field, made up of strata belonging to the true coal measures, and the carboniferous rocks which underlie it are also fully described. The Permian rocks of a portion of the Nith basin, having porphyries in different beds at their base, and brick-red sandstones with trapean detritus forming their upper portion, and also rocks of the same age occurring on the shore near Corsewall House, Wightonshire, are subjects treated of in the Memoirs. Igneous rocks of an age posterior to the Permian are also referred to. Superficial deposits in the condition of drift sands, and gravels, brick clays, and erratic blocks, also still more recent products in the form of raised sea beaches, blown sands, peat and alluvium are fully alluded to. Finally the explanations afford information concerning the economic minerals of the several districts, the whole containing a record of an amount of careful observations and inferences such as could only have been arrived at by the labour and experience of such

a staff of officers as that which constitutes the Geological Survey.

ROBERT HARKNESS

LEYBOLD'S EXCURSION TO THE ARGENTINE PAMPAS

Excursion a las Pampas Argentinas: hojas de mi diario: Febrero de 1871: Seguido de tablas de observaciones barométricas, un boceto de la ruta tornaa. Por Federico Leybold. 8vo, pp. 108. (Santiago, 1873.)

THE publication of a book relating to Natural History in Chili is a rare event, and therefore well worthy of record. Except Philippi and Landbeck's "Catalogo de las Aves Chilenas," and some few papers by the same authors in the "Anales" of the University of Santiago, the present is almost the first that has come before our notice. And these, it must be recollected, are not the productions of native Chilians, but of members of the all-pervading Teutonic race, who have brought their science with them from their distant fatherland.

Herr Leybold, or Don Federico Leybold, as we suppose we must call him, for he writes in Spanish, has been long resident in Santiago, and active in investigating every branch of Natural History in his adopted country. During the last few years, as he tells us in the introductory chapter of the present work, he has sent six expeditions over the Andes to explore the natural riches of the "Argentine Tempe," and finally in the month of February of 1871 was able to make arrangements to proceed himself upon a collecting tour into the same district. The route taken from Santiago was up the valley of the Maipo, to the junction with it of the "Valle del Yeso," and thence up this northern branch to the foot of the "Portillo de los Piuquenes," where the watershed was crossed. But a second and more elevated pass—the "Portillo Mendocino"—succeeds on this route over the main chain, which is, we believe, that usually taken to Mendoza. From the summit the descent was made over the elevated eastern slopes of the Mendocan Andes to an estancia called Vistaflares, situated at the foot of the range, which was made the headquarters of the party while they explored the surrounding country. Rainy weather and drunken servants much hindered operations during the stay at this place, which appears only to have lasted about a week, when it was determined to return to Santiago by the more southern "Paso del Diamante." This pass leads under the volcano of Maipo into the main valley of the Maipo, and thus enabled the travellers to join their former route after about a week's difficult and occasionally dangerous travel amid the snows and storms of the higher Andes.

Herr Leybold's diary of this interesting month's excursion is replete with notes and observations in every branch of Natural History—Zoology, Botany, and Geology. Birds, beetles, and plants appear to have engaged his chief attention—but other objects are not passed unnoticed. Not only are frequent references given to known species observed in the Andes and on the adjacent districts of the Argentine Republic, but descriptions are introduced of species believed to be new to science, and discovered on this occasion. Thus we have characterised

(p. 29) a new Crustacean—*Eglea audina* (pp. 36, 37), two new Violets, *Viola acanthophylla*, and *V. portulacea* (p. 38), a new Pigeon, *Columbina aurisquamata* (p. 45), *Oreosphacus*, a new genus of Menthoidæ; and subsequently two new Snakes, *Bothrops ammodytoides* and *Pelias trigonatus*.

As regards these and other supposed novelties, it may be remarked that it is not very convenient to scatter such descriptions through the pages of a book of travels, where they are liable to escape notice. Moreover, an isolated worker in a remote part of the earth's surface is in great danger of not knowing what is already known to others, and should take the precaution of consulting some correspondent in the great European centres of scientific activity before publishing what is new to him as new to every one else. Dr. Finsch has already shown that Leybold's *Conurus glaucifrons* is a well-known species of Parrot; and we do not doubt that most of the other supposed novelties will be found to have been previously described elsewhere.

P. L. S.

A HEALTHY HOUSE

What a House should be, versus Death in the House. By William Bardwell, Architect and Sanitary Engineer (London: Dean and Son.)

THE author of this work is evidently an enthusiast in sanitary matters, but there is much in it worth the attention of the professional architect and builder, as also of the house-owner and occupier. It will be some time before the precepts of hygienic architecture can be expected to pervade all classes of the community; but reforms in this direction must commence from above, and will gradually be accepted by the poorer classes: this work will assist the dissemination of wholesome rules.

The subject of drainage, which necessarily occupies much of the work, has been forced into prominence by the dangerous illness of the Prince of Wales, in the Autumn of 1871; and this work meets to some extent the demand for further and better information on the subject. Our author is not new to the task, having so long ago as 1828 turned his attention to the sanitary conditions of buildings, and has published several treatises on cognate subjects. The work before us, however, is suggestive rather than profound, and we find a tendency in it to describe very prosaic details in stilted language. There is also a general want of references, so that many of the statements cannot be easily verified—such, for instance, as this, p. 6, art. 10:—"We have progressed some little since 1828, when my first essays on health were published, and public attention has been directed to the subject; but still, one half of the children born in London and other large towns, die before they are three years old; while at a parish in Norfolk, where the principles here set forth are rigidly enforced by the excellent rector, a child is never known to die." After making, however, every abatement—as we are bound to do—the work will not fail to prove very useful, and will assist in leading people to better sanitary arrangements.

In p. 8 he justly animadverts on many modern cottages, which "from admiration of mediæval architecture are irregular in plan, and irregular in outline from an idea of being picturesque; and hence the chimneys are outside,

involving loss of heat, the roof all hips and valleys, and dormer windows requiring constant repairs, and exhibiting an utter ignorance of the very first principles of a healthy home." Some fallacy seems, however, involved in the passage which follows, and which describes the effect of asphalted ground floors in some Essex cottages. The inhabitants suffered from rheumatism until the asphalt was covered with boards—"because the boards were conductors of damp, whilst the asphalt was a non-conductor of moisture." It must have been the conduction of temperature, and not of moisture, that led to the inconvenience.

Chapter ii. is on bad drainage, and opens sensibly thus:—"The use of water in cabinets in disobedience to God's command to the Israelites to bury excreta in the earth is unquestionably the cause of those alarming modern diseases—the something in the air—with which the whole country is affected." It may be impossible to return to the more primitive practice, but the fact remains that even the old cesspool system was less unhealthy than the modern more artificial one. Some valuable hints are given in pages 12—13, for discovering the inlets of sewer gases into houses. The closet soil-pipe is often the origin of these irruptions; for the inclosed gases decompose the soldered joints of the lead pipe in a few years' time, if the pipe is not ventilated, as indeed it seldom is, and the junction of the lead-pipe with the drain is often defective. Every sink, too, which modern luxury has introduced to save the old-fashioned labour of throwing slops away out of doors, opens a pathway for the poisonous gases, of which one part in 260 mixed with common air is fatal to life, and of which no sensible proportion can long be breathed with impunity.

There is also a moral aspect to the question. The following passage is introduced as a quotation, but it does not appear from what author, p. 19:—

"A clean, fresh, and well-ordered house exercises over its inmates a moral no less than a physical influence, and has a direct tendency to make the members of the family sober, peaceable, and considerate of the feelings and happiness of each other."

In chap. iii. are some valuable remarks about drains stink-traps, and rain-water pipes. Water-closets, it is said in p. 29, should never be in a basement—for if so, the house is liable to draw its supply of air through them—but always in a back-yard. Those that are wanted to be in immediate connection with the house should be in the upper floors only, and, whenever practicable, approached through a greenhouse.

At p. 33 are some remarks on the necessity of pure, untainted water; and, in p. 34, on the danger of lead-poisoning. The pipes made by Messrs. Walker, Campbell & Co., of Liverpool—lead-cased block-tin pipes—are recommended in those cases where the water acts upon lead. A caution as to the use of these pipes should, however, have been added, as very great care and peculiar arrangements are required in jointing them; otherwise, the combination of the two metals becomes exposed to the action of the water at the joints, when decomposition will take place, and the water will still be affected with lead.

In p. 41 the importance of a dry basement is inculcated, and with a well-merited encomium on Mr. John Taylor's clever contrivance of the damp-proof